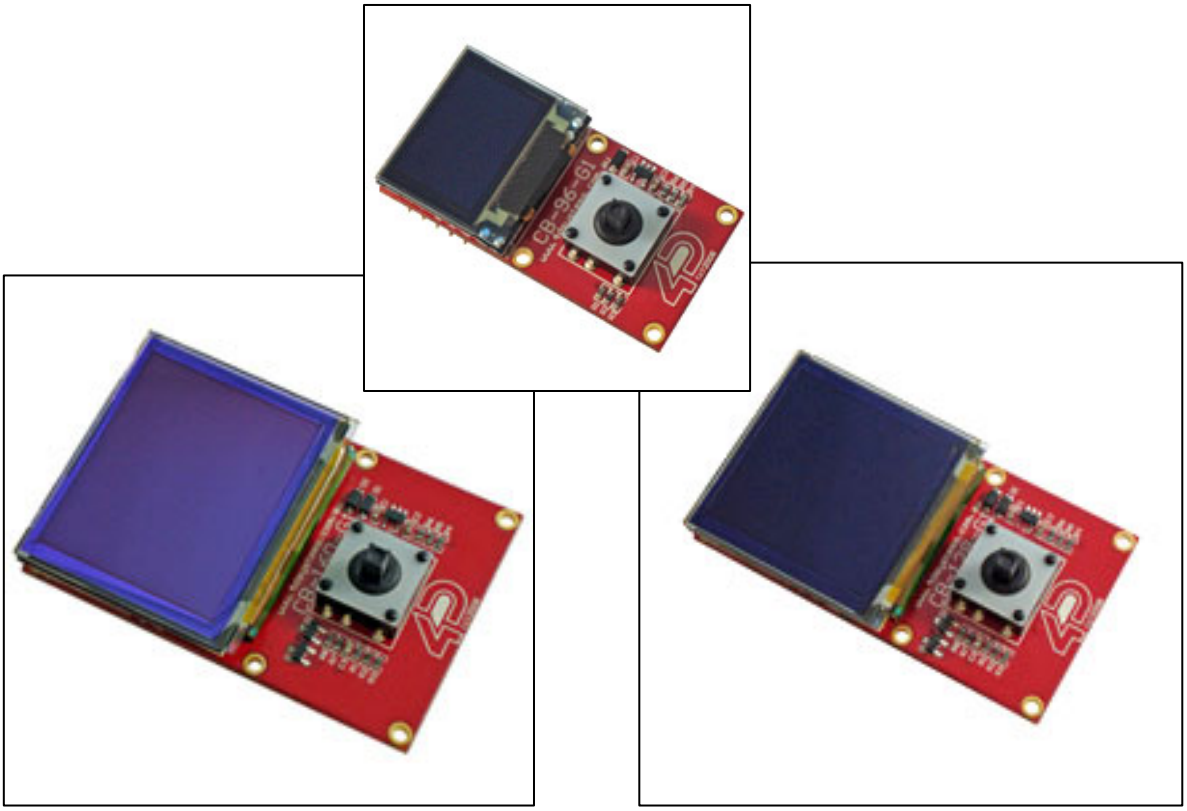
CARRIER BOARDS

CB-96-G1, CB-128-G1, CB-160-G1

with Joystick and Sound

Users Manual

Document Revision A



4D Systems

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1. Introduction

The **CB-96-G1**, **CB-128-G1** and the **CB-160-G1** are compact carrier boards designed to provide a simple means of adding user input to the already capable µOLED-96-G1, µOLED-128-G1 and the µOLED-160-G1 intelligent display modules. The tiny 5-position joystick, along with an on-board speaker on the CB-128-G1 and CB-160-G1 carrier boards, facilitates user input and output for these displays.

The joystick can be used for menu navigation, exciting game play or any kind of user input needed for your applications.

The small speaker can be used for game sounds, audible feedback for user interaction with applications or just to experiment with the sound capabilities of the embedded GOLDELOX processor on the display modules.

The carrier board also provides a secure stable attachment for the µOLED displays. When the display is mounted on the carrier board, the combination provides additional protection for the display.

This document covers the following 3 carrier boards:

- **CB-96-G1** (for the µOLED-96-G1 display module)
- **CB-128-G1** (for the µOLED-128-G1 display module)
- **CB-160-G1** (for the µOLED-160-G1 display module)

2. CB-96-G1 Carrier Board

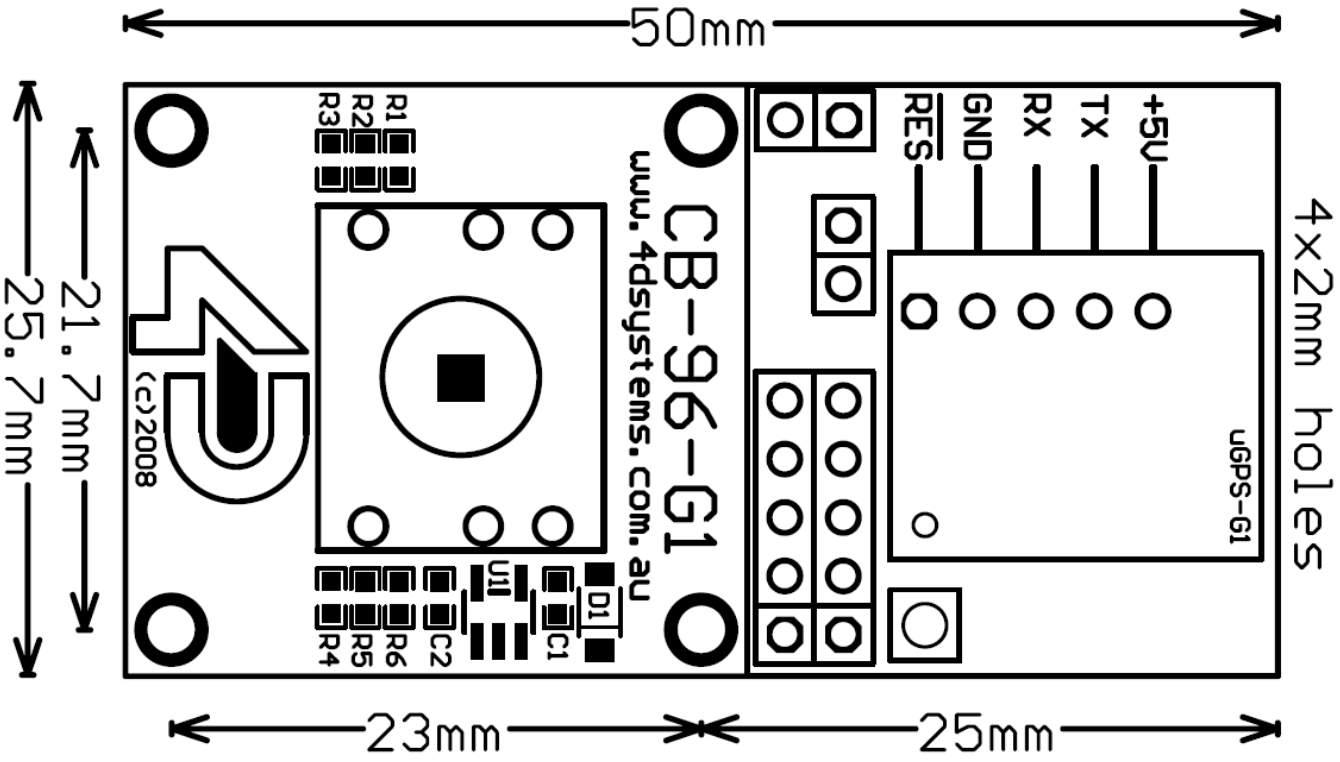
The **CB-96-G1** is the carrier board for the **µOLED-96-G1** display module. It has the tiny 5-position Joystick. See Appendix-A "Joystick Circuit" for a detailed explanation.

Note1: The CB-96-G1 does not incorporate a speaker or the sound circuit.

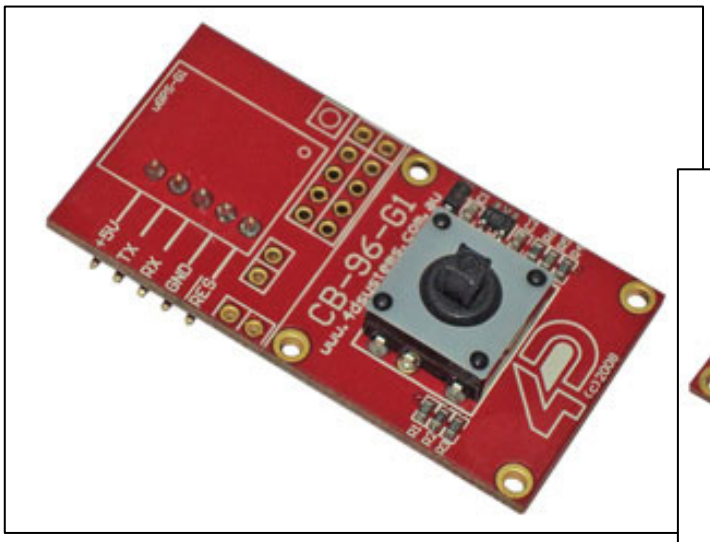
Note2: The µOLED-96-G1 display module and the µUSB-MB5 or µUSB-CE5 are not included with the CB-96-G1 Carrier Board and these modules must be purchased separately.

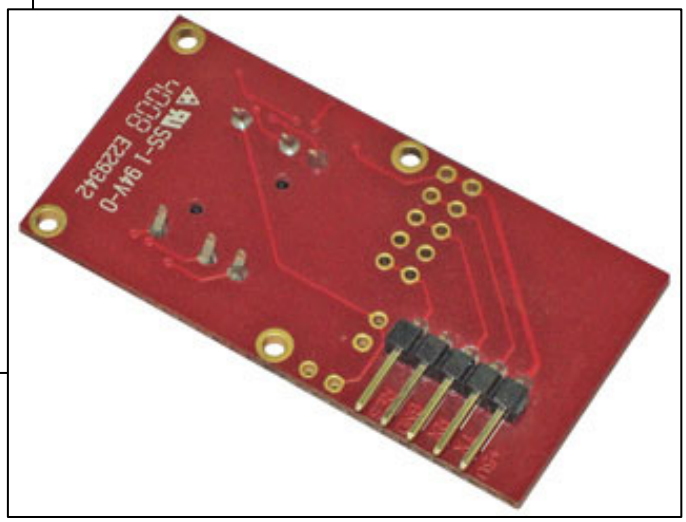
The following images illustrate various ways of attaching the µOLED-96-G1 to the CB-96-G1 carrier board.

2.1 Mechanical Information

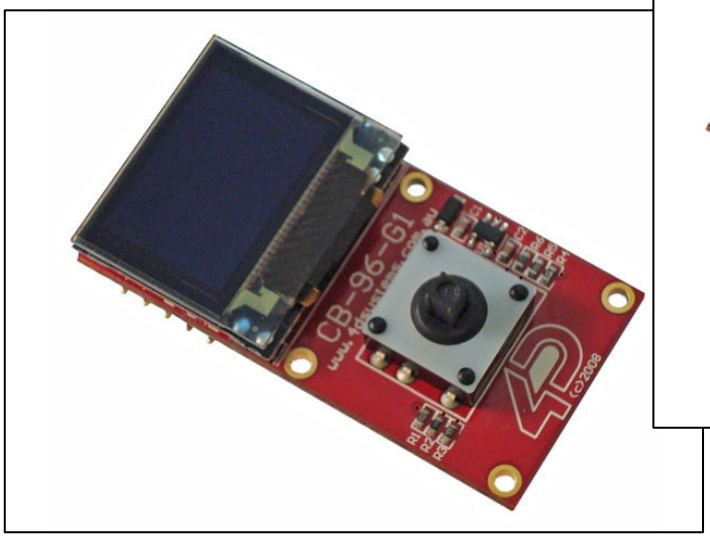


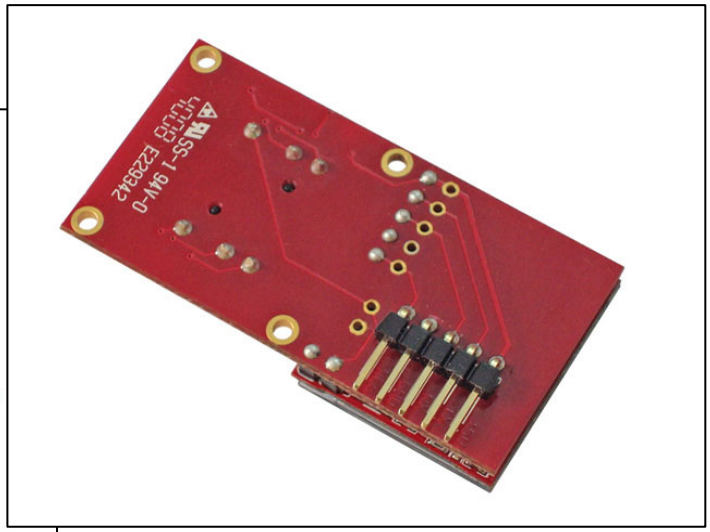
2.2 Bare Board



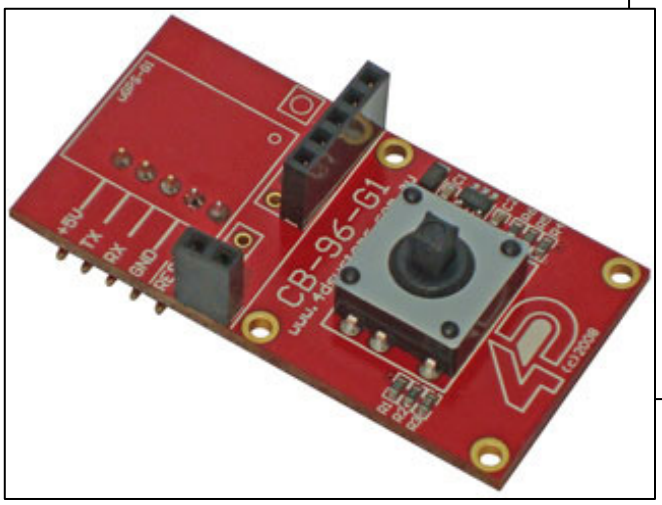


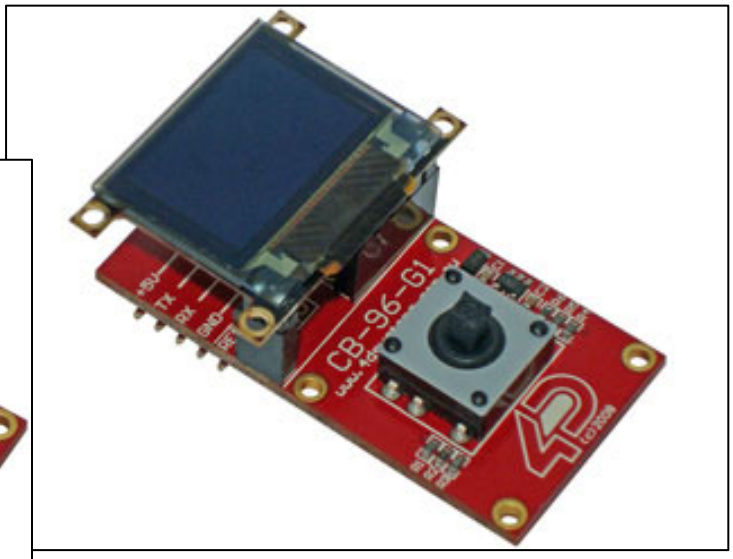
2.3 Attaching the µOLED-96-G1 - Directly Soldered





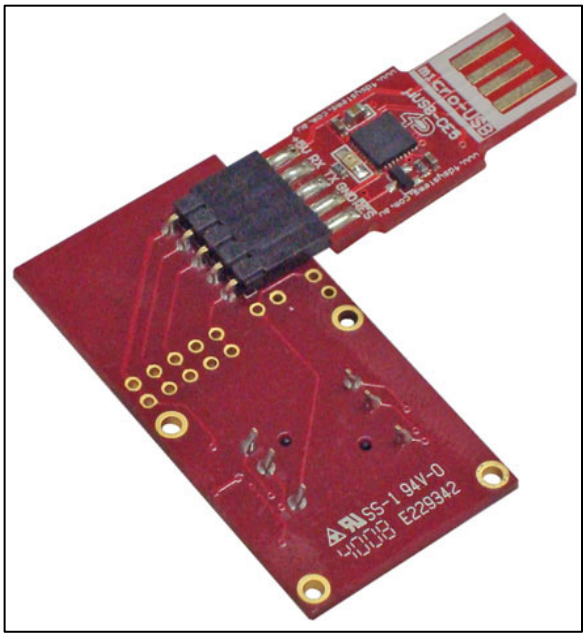
2.4 Attaching the µOLED-96-G1 - via Female Headers

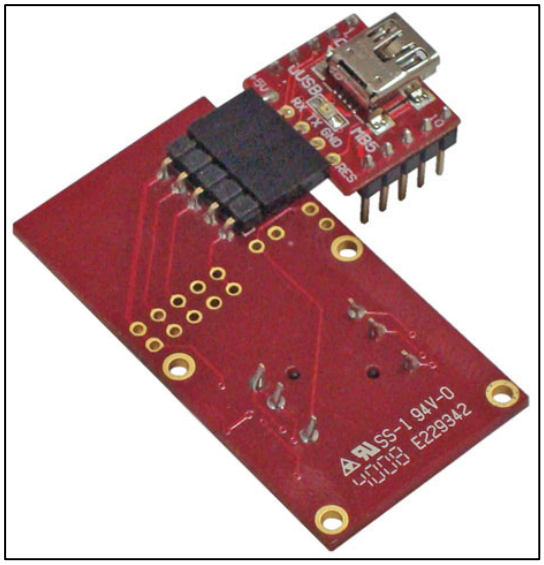




The female headers are soldered as above

2.5 µUSB-CE5 and µUSB-MB5 Interface





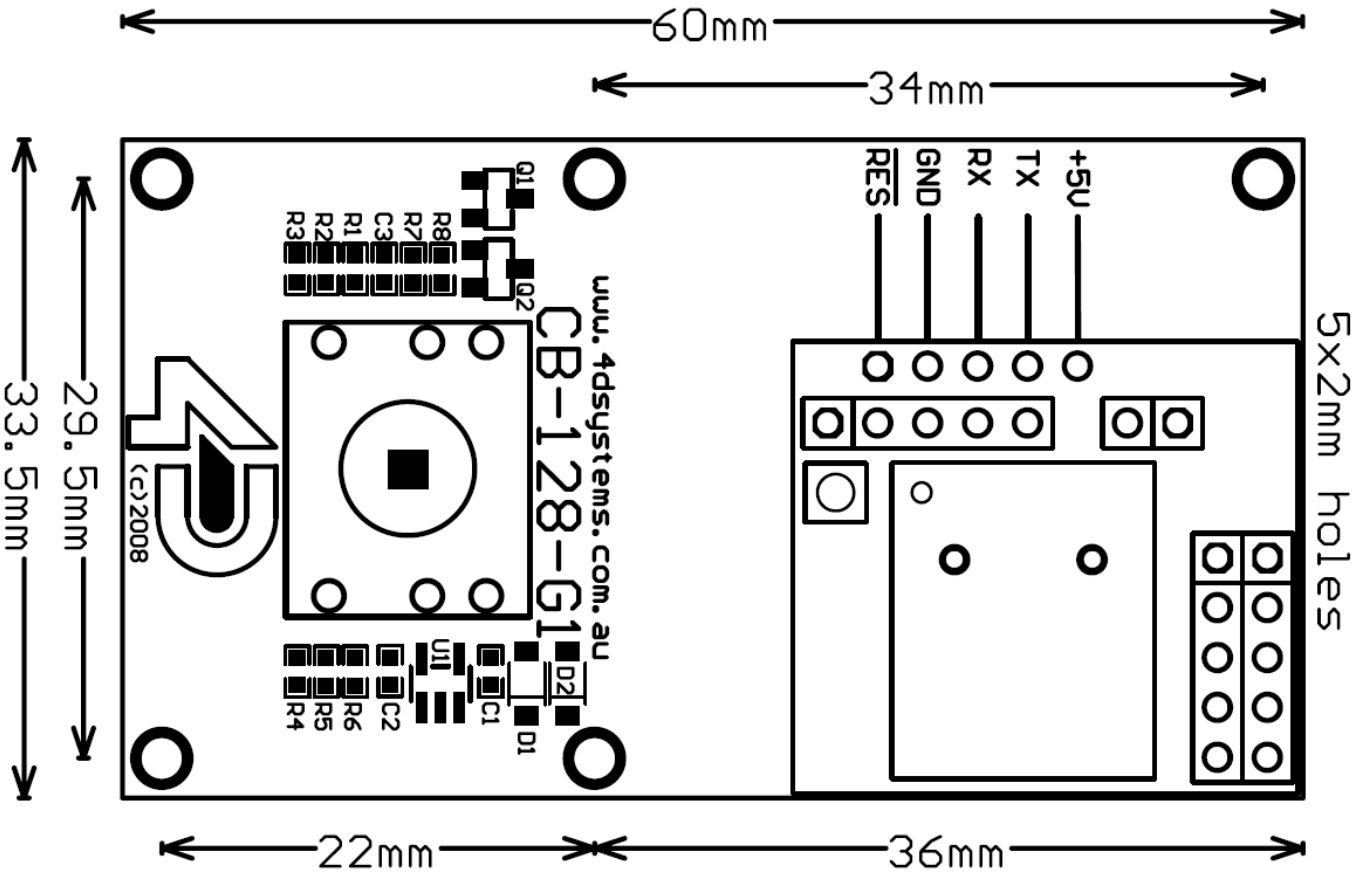
3. CB-128-G1 Carrier Board

The **CB-128-G1** is the carrier board for the **µOLED-128-G1** display module. It has the tiny 5-position Joystick as well as a miniature speaker and driver circuit. See Appendix-A “Joystick Circuit” and Appendix-B “Speaker Circuit” for detailed explanations.

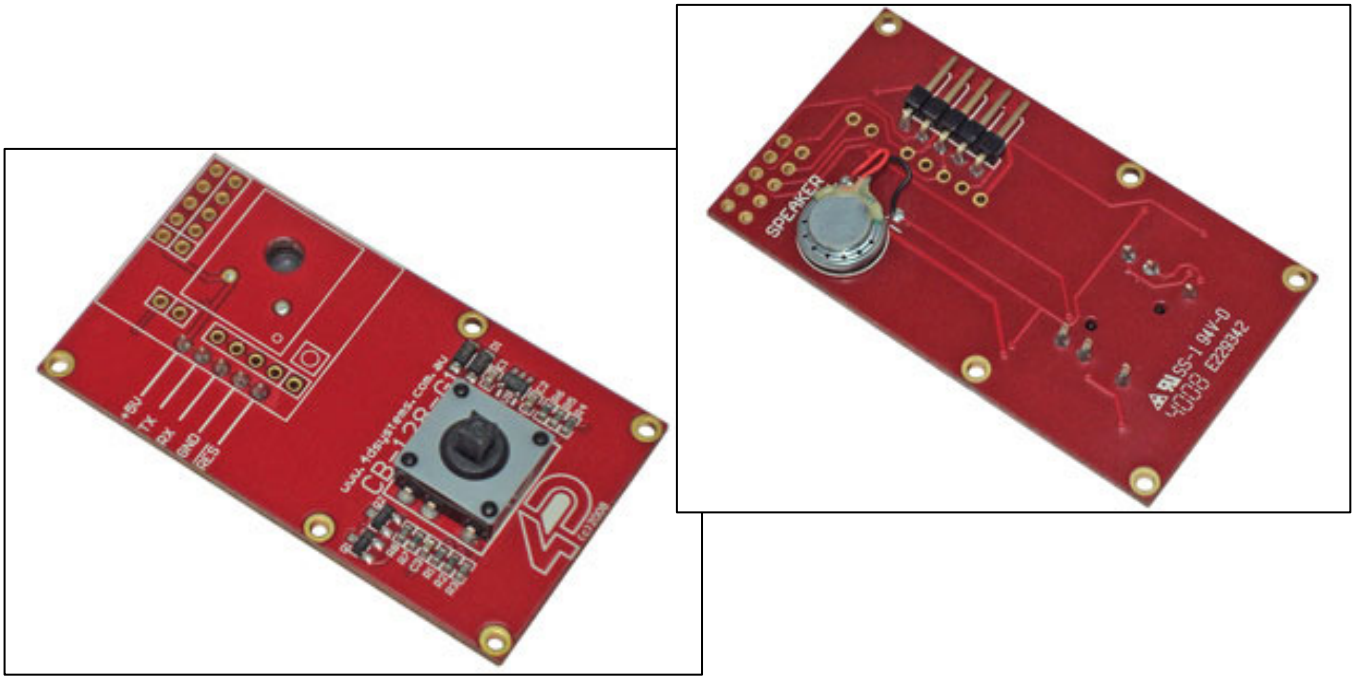
The following images illustrate various ways of attaching the µOLED-128-G1 to the CB-128-G1 carrier board.

Note: The µOLED-128-G1 display module and the µUSB-MB5 or µUSB-CE5 are not included with the CB-128-G1 Carrier Board and these modules must be purchased separately.

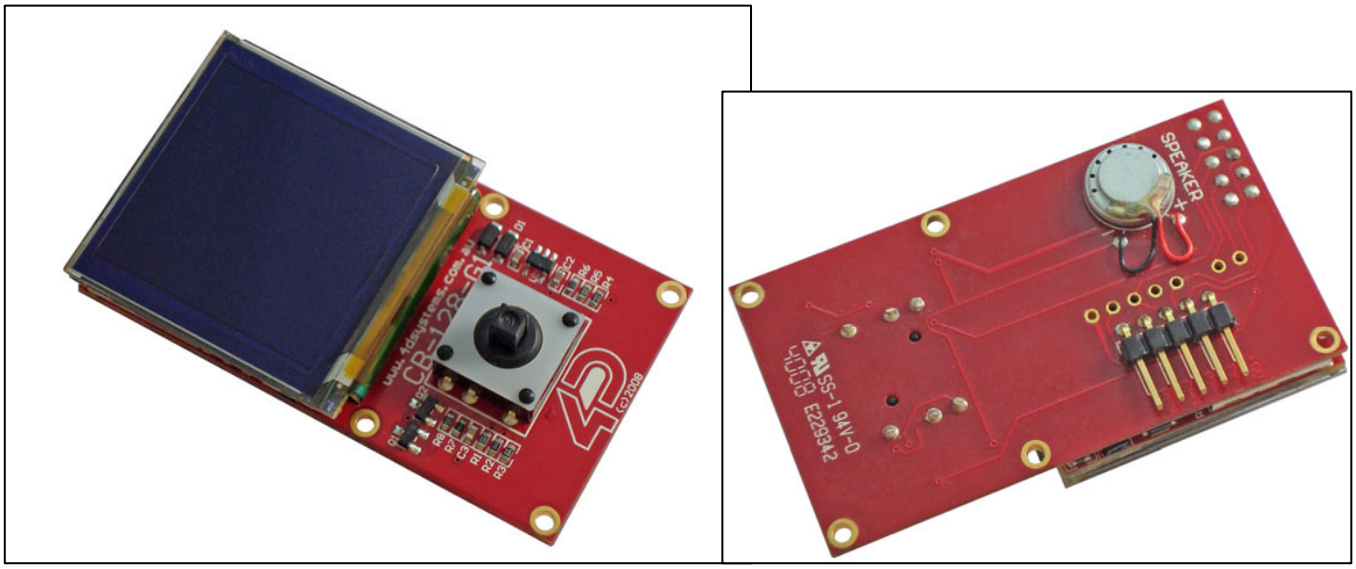
3.1 Mechanical Information



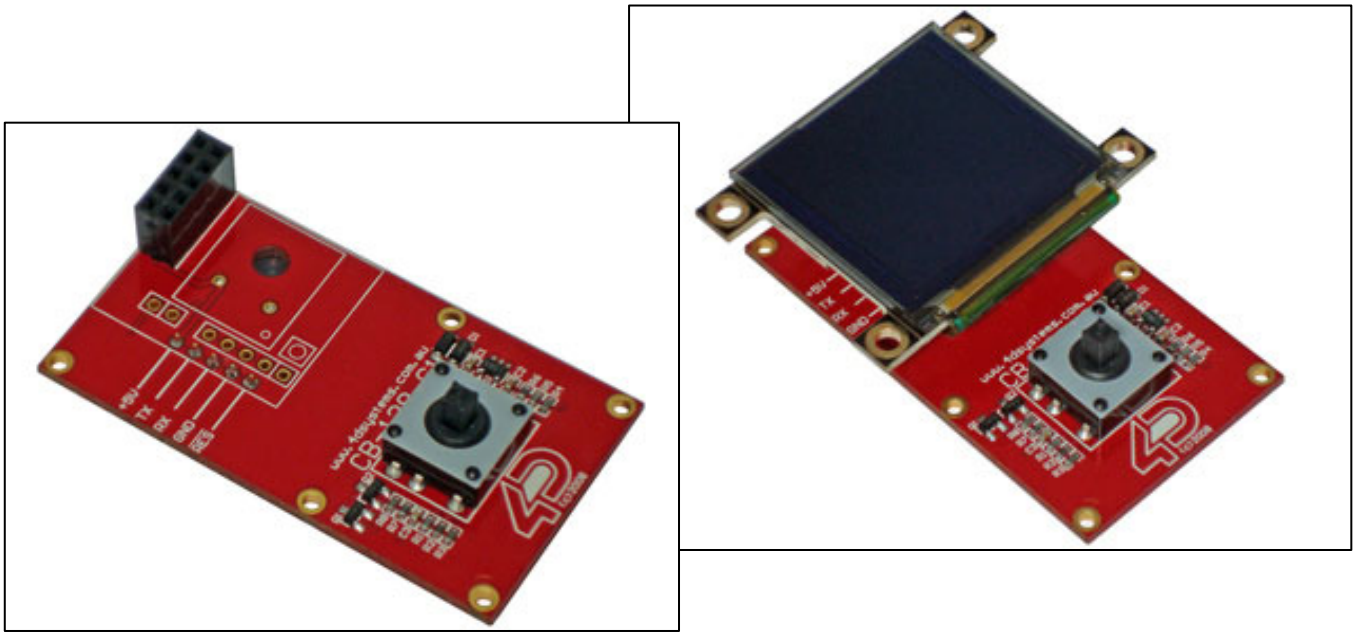
3.2 Bare Board



3.3 Attaching the µOLED-128-G1 - Directly Soldered

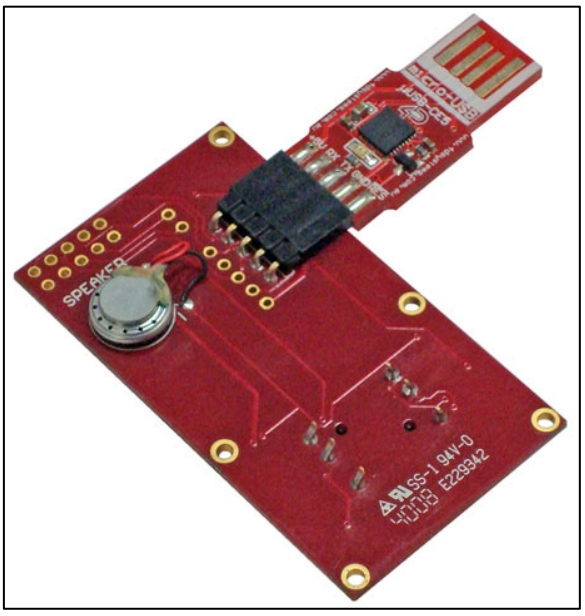


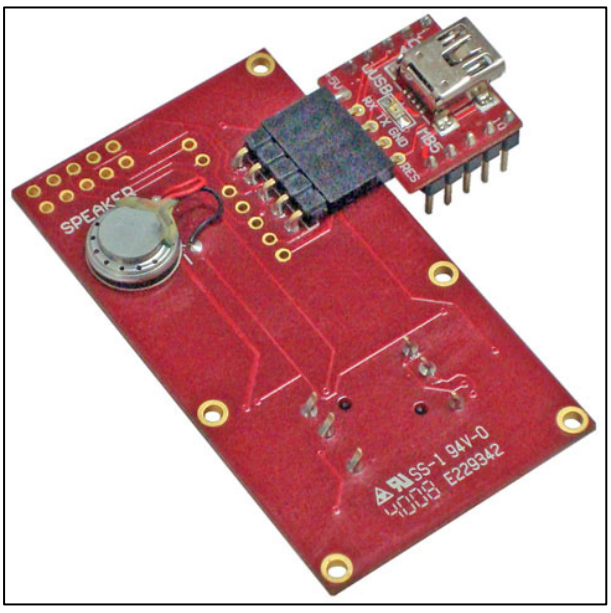
3.4 Attaching the µOLED-128-G1 - via Female Headers



The female headers are soldered as above

3.5 µUSB-CE5 and µUSB-MB5 Interface





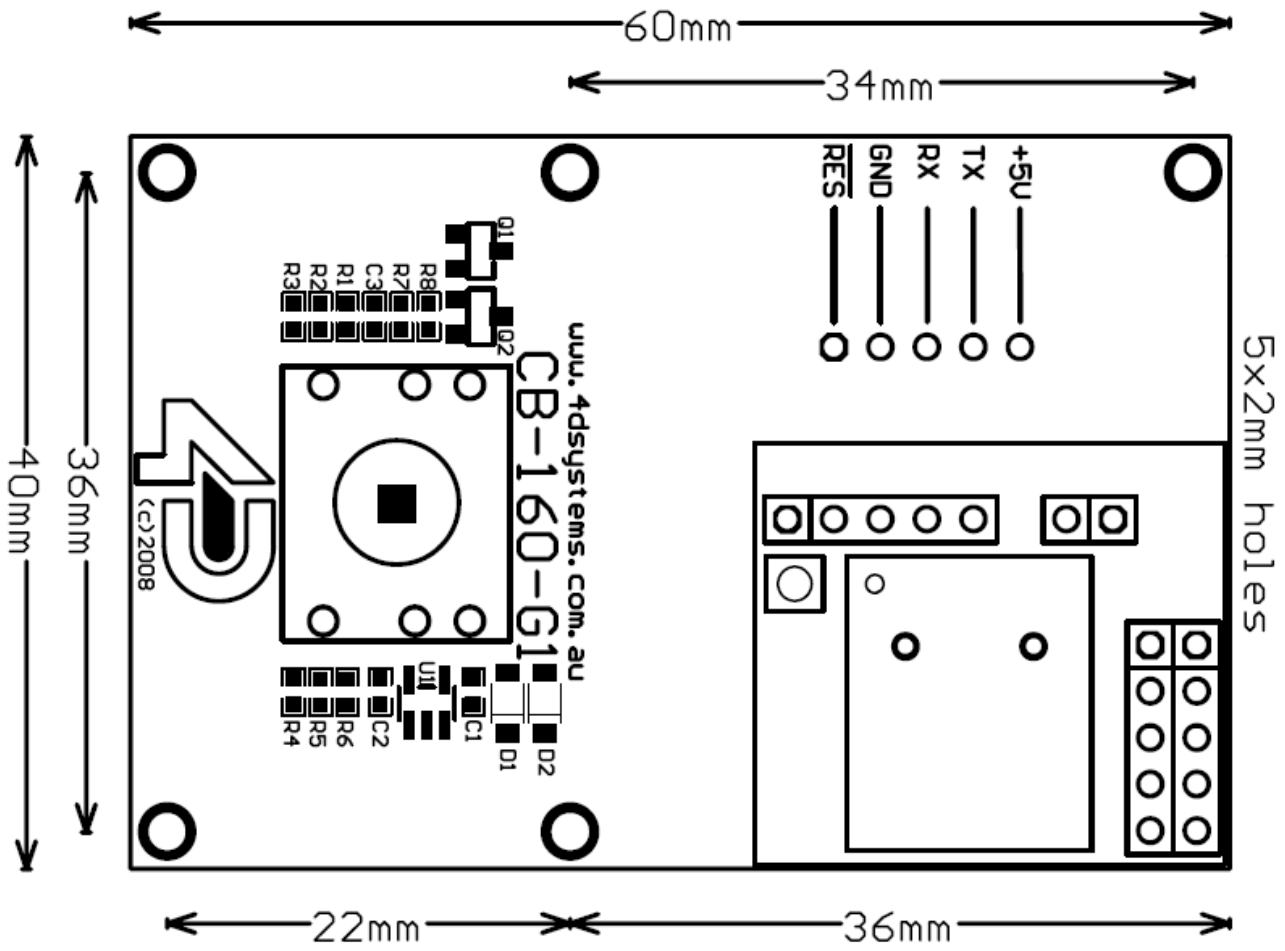
4. CB-160-G1 Carrier Board

The **CB-160-G1** is the carrier board for the **µOLED-160-G1** display module. It has the tiny 5-position Joystick as well as a miniature speaker and driver circuit. See Appendix-A “Joystick Circuit” and Appendix-B “Speaker Circuit” for detailed explanations.

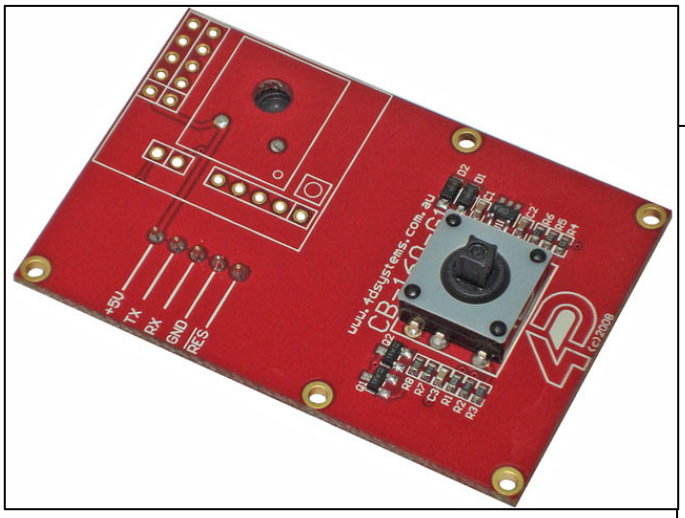
The following images illustrate various ways of attaching the µOLED-160-G1 to the CB-160-G1 carrier board.

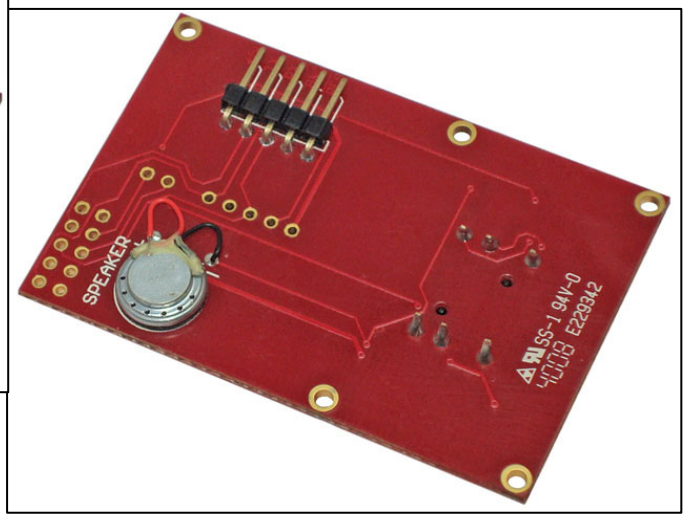
Note: The µOLED-160-G1 display module and the µUSB-MB5 or µUSB-CE5 are not included with the CB-160-G1 Carrier Board and these modules must be purchased separately.

4.1 Mechanical Information

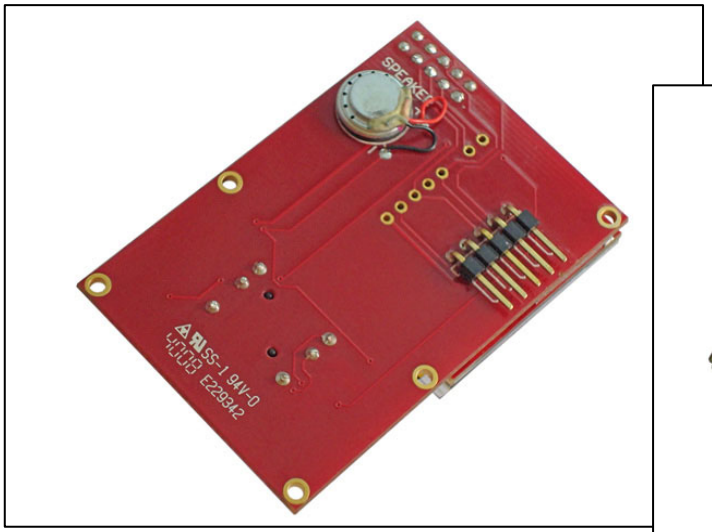


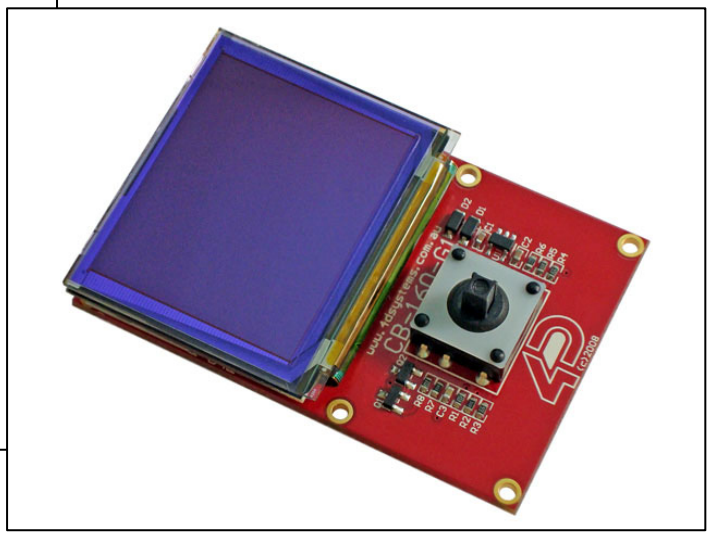
4.2 Bare Board



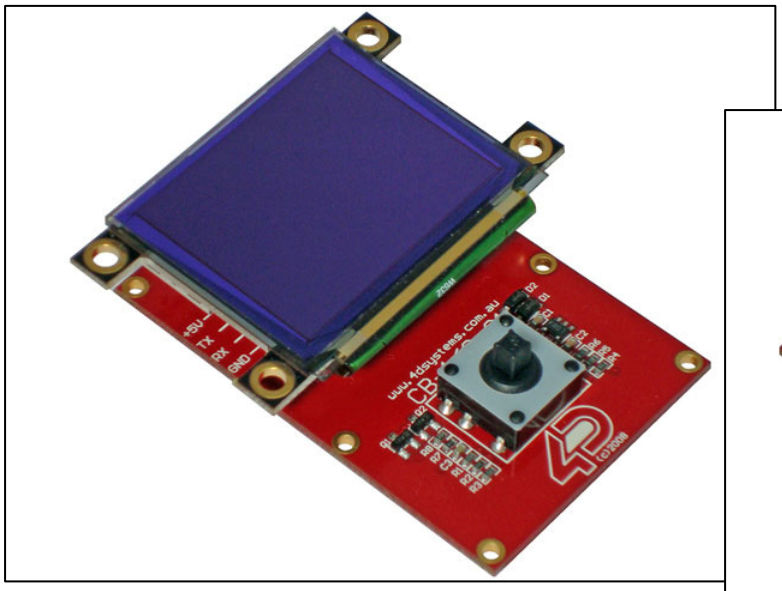


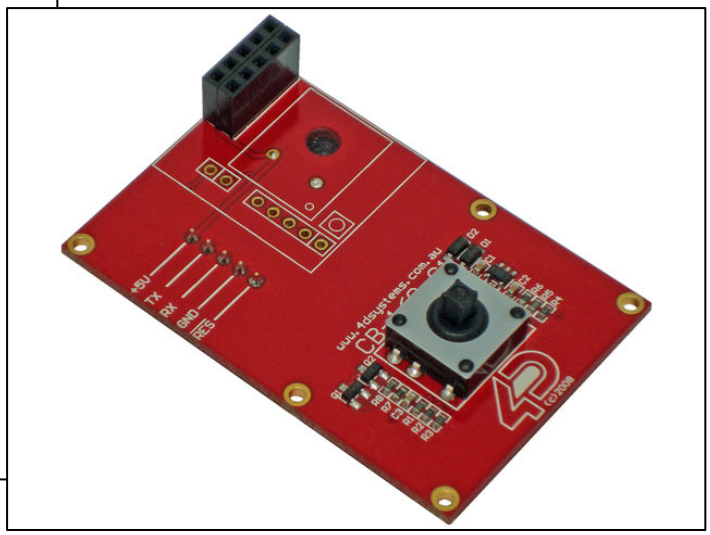
4.3 Attaching the µOLED-160-G1 - Directly Soldered





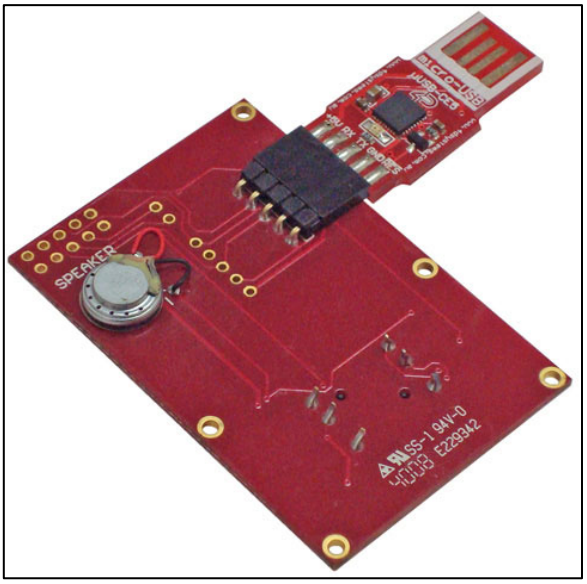
4.4 Attaching the µOLED-160-G1 - via Female Headers

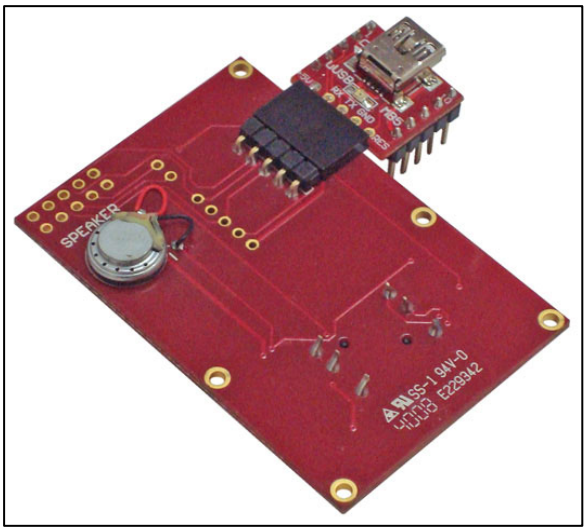




The female headers are soldered as above

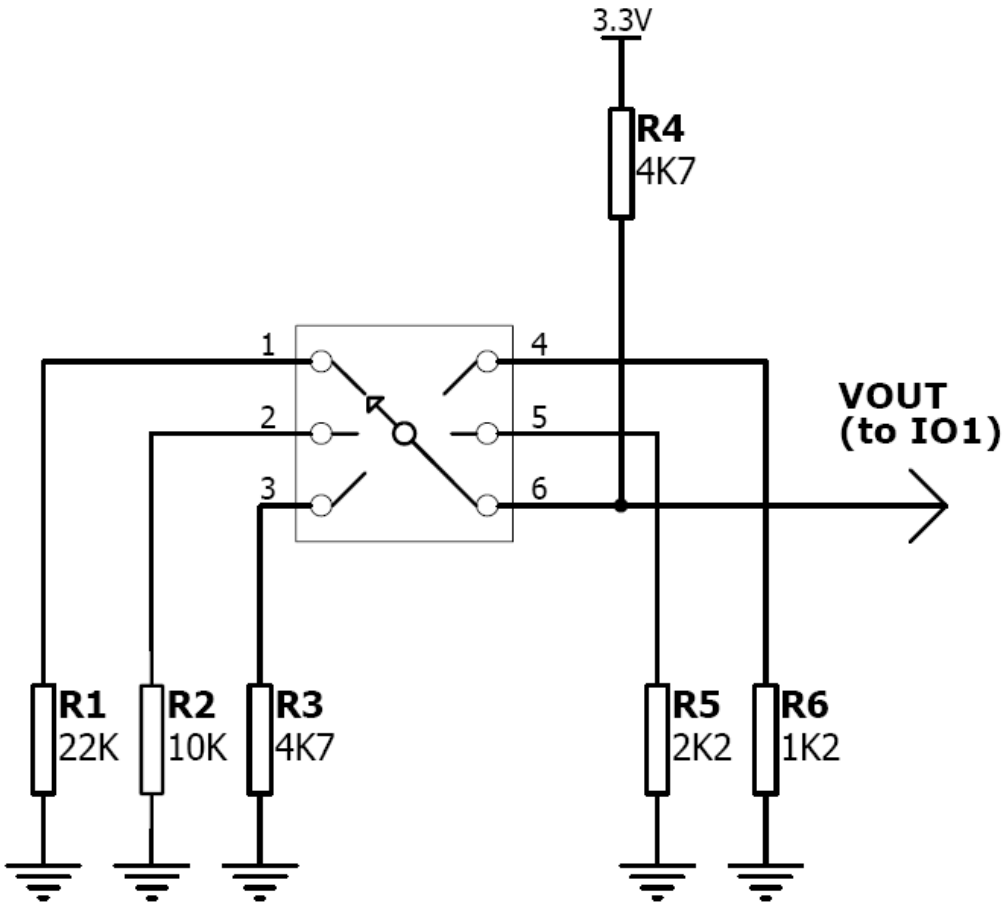
4.5 µUSB-CE5 and µUSB-MB5 Interface





Appendix-A: Joystick Circuit

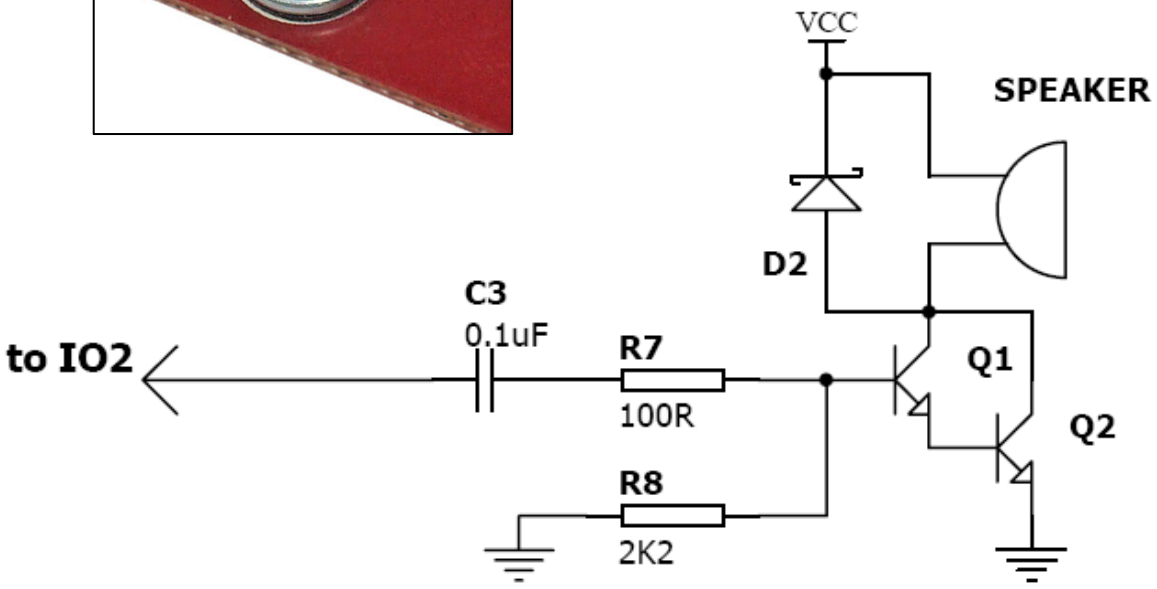
The Joystick is a 5 position multi switch and each position connects to a junction of a resistor ladder network that forms a voltage divider. The **IO1** pin of µOLED-96-G1, µOLED-128-G1 and µOLED-160-G1 display modules can be programmed as an Analogue to Digital (A2D) converter input under 4DGL. Utilising the A2D feature, each individual switch position voltage value can be read and decoded. The IO1 pin of the display modules are directly connected to the output of the joystick voltage divider circuit.



ACTION	VOUT
UP	0.82*3.3V = 2.71V
LEFT	0.68*3.3V = 2.24V
DOWN	0.50*3.3V = 1.65V
RIGHT	0.32*3.3V = 1.05V
PRESS	0.20*3.3V = 0.66V
IDLE	= 3.30V

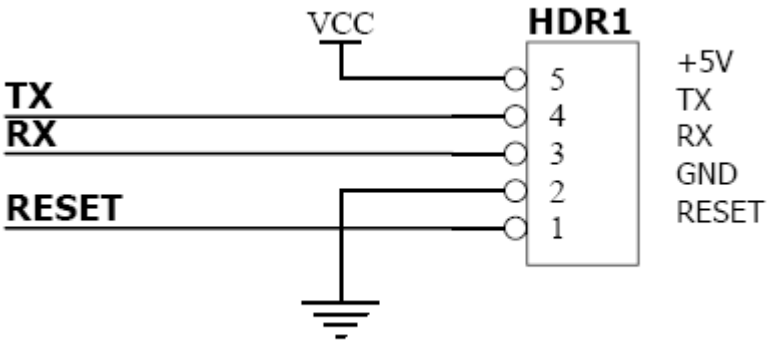
Appendix-B: Speaker Circuit

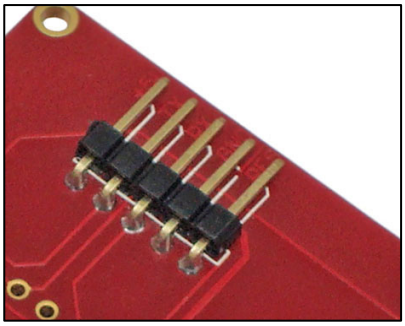
The µOLED-96-G1, µOLED-128-G1 and µOLED-160-G1 display modules under **4DGL** program applications, are capable of generating complex sounds and music from their respective I/O pins. The **IO2** pin of µOLED-128-G1 and µOLED-160-G1, on their respective carrier boards, is connected to the speaker circuit as illustrated in the circuit below. The µOLED-96-G1 module has only a single I/O pin (IO1), which is taken up by the previous Joystick circuit and therefore audio is not available on the CB-96-G1 board.

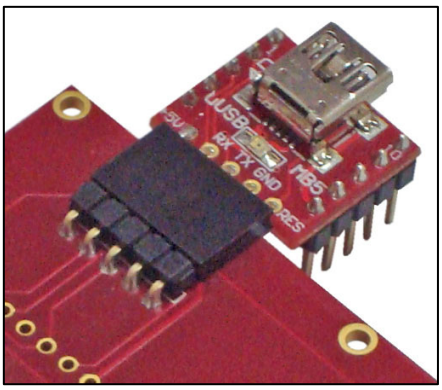


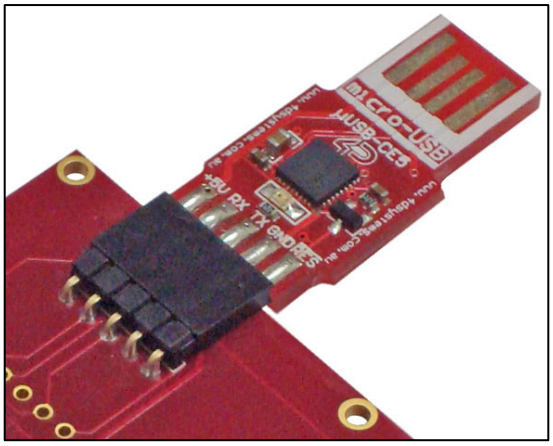
Appendix-C: µUSB/User Interface

The 5 pin male header interface, underneath the board, is used to attach either a µUSB-MB5 or µUSB-CE5 as illustrated below.





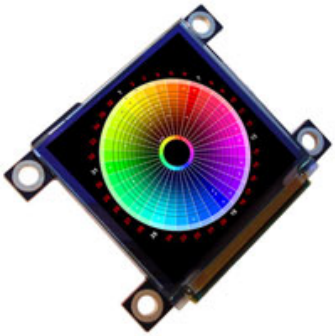




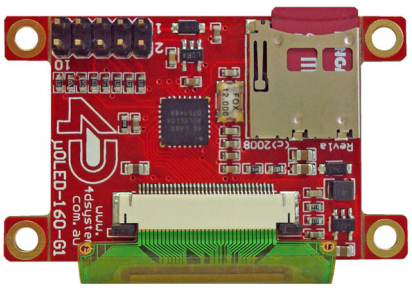
Appendix-D: Related Products and Tools

µOLED-96-G1
Display module for the CB-96-G1: www.4dsystems.com.au/prod.php?id=9

µOLED-128-G1
Display module for the CB-128-G1: www.4dsystems.com.au/prod.php?id=28



µOLED-160-G1
Display module for the CB-160-G1: www.4dsystems.com.au/prod.php?id=29

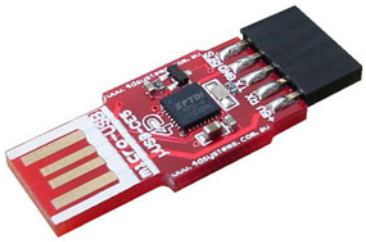


µUSB-MB5

USB to Serial Converter: www.4dsystems.com.au/prod.php?id=18

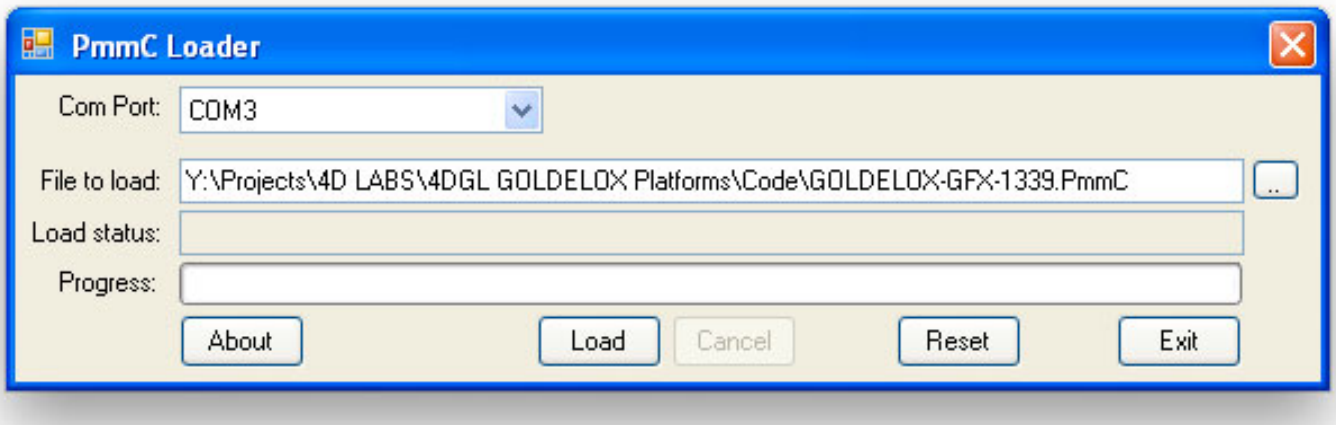
µUSB-CE5

USB to Serial Converter: www.4dsystems.com.au/prod.php?id=19



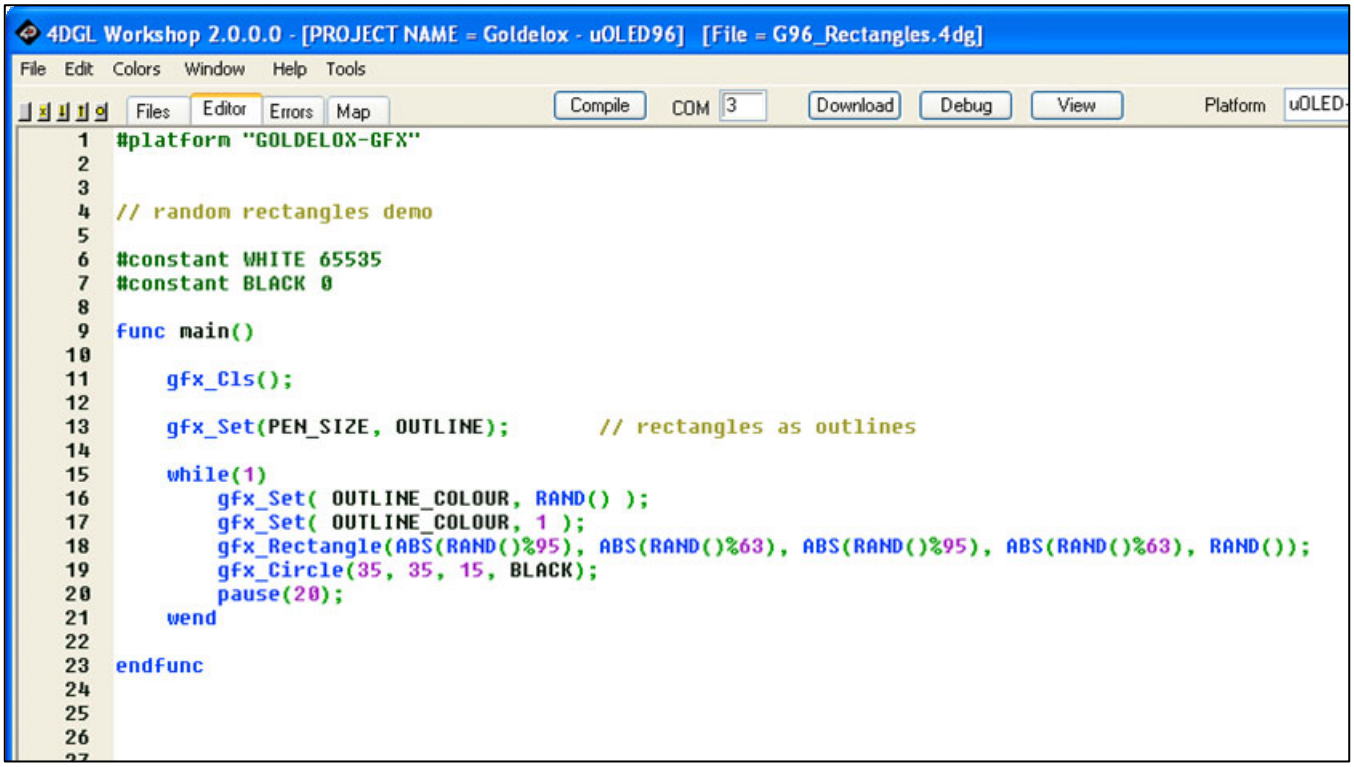
PmmC-Loader (free Software Tool)

The 'PmmC Loader' is a free software tool for Windows. Use this tool to download and program the latest PmmC file into the GOLDELOX-GFX processor which is embedded in your display module. The latest version can be downloaded from: http://www.4dsystems.com.au/prod.php?id=46



4DGL-Workshop IDE (free Editor, Compiler, Downloader)

The 4DGL-Workshop IDE provides an integrated software development environment for all of the 4D family of processors and modules. The IDE combines the Editor, Compiler and Downloader to develop complete 4DGL code applications. All user application code is developed within the Workshop IDE. A sample application code is listed below.

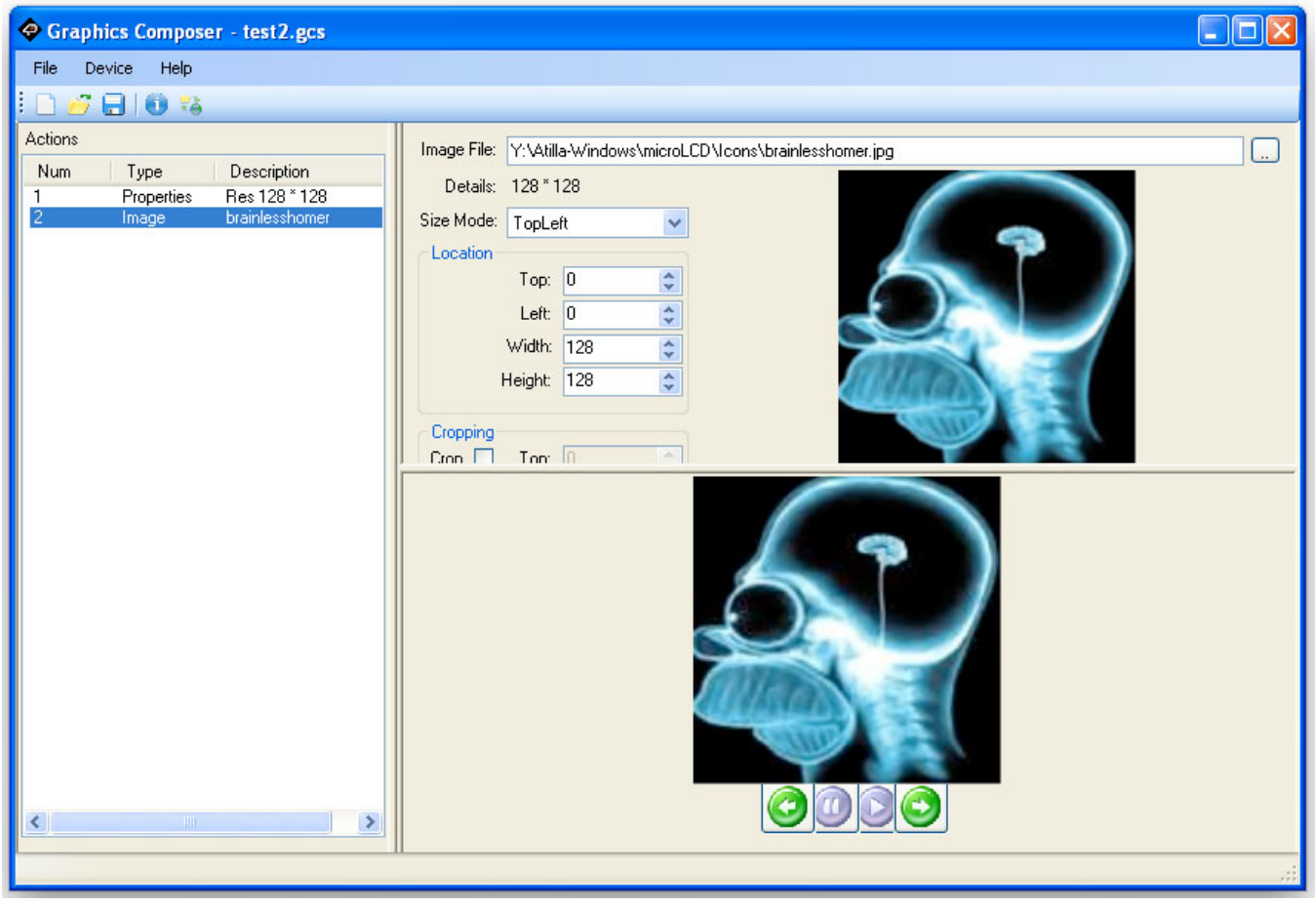


The 4DGL-Workshop IDE is provided free and the latest version can be downloaded from: www.4dsystems.com.au/developers/

Graphics Composer (free Software Tool)

The Graphics Composer is a free software tool for Windows. This software tool is an aid to composing a slide show of images/animations/movie-clips (multi-media objects) which can then be downloaded into the SD/uSD/MMC memory card. The multimedia objects can then be used within the 4DGL application code. The latest version can be found here:

www.4dsystems.com.au/downloads/Graphics_Composer/



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